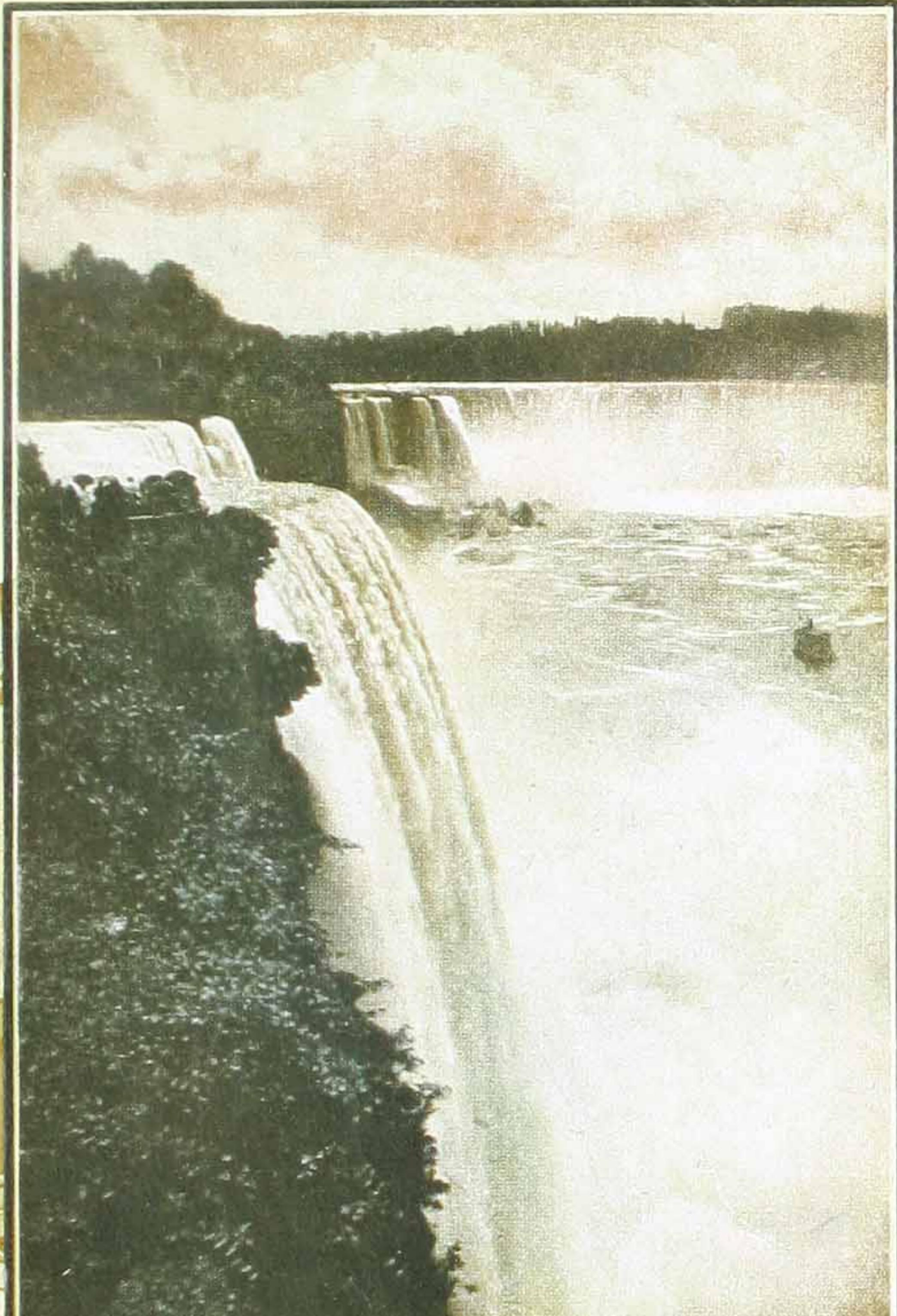


21.2

Carl Horing

Feb. 26, 1908

THE POWER of NIAGARA

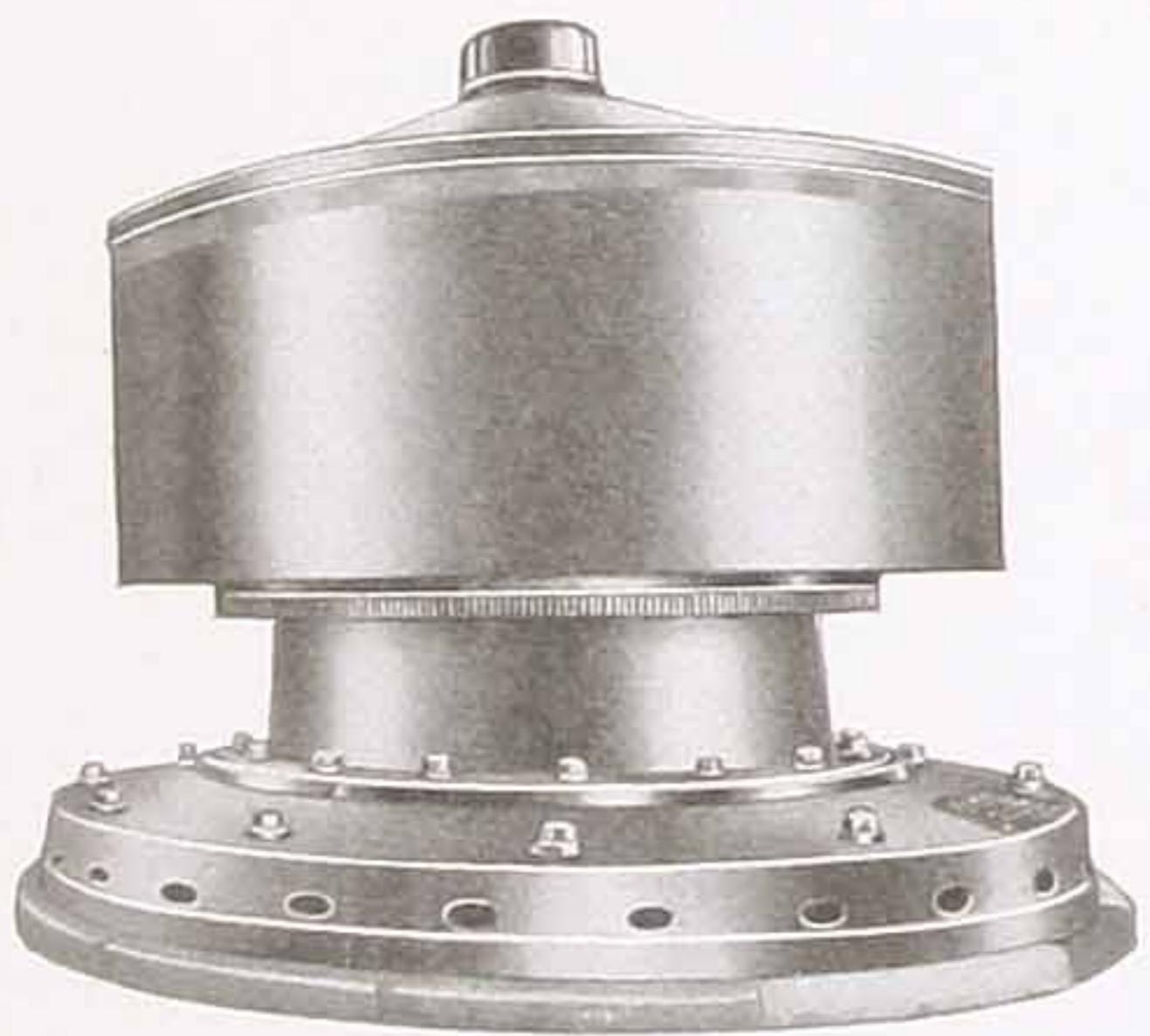


"NATURE'S STOREHOUSE IS MAN'S
BENEFACITOR, AND NO GIFT FROM
IT RENDERS GREATER SERVICE
THAN THE WATERS OF THE EARTH"

THE NIAGARA FRONTIER FUTURE MANUFACTURING CENTRE OF THE WORLD

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BY THE NIAGARA FALLS POWER COMPANY
NIAGARA FALLS, NEW YORK

THE POWER *of* NIAGARA



The Niagara Falls Power Company

Niagara Falls, New York, U. S. A.

Canadian Niagara Power Company

Niagara Falls, Ontario, Canada

Some of the advantages obtained by using power supplied by The Niagara Falls Power Company and Canadian Niagara Power Company at Niagara Falls.

Electric power from Niagara is cheaper than power derived from coal.

Electrical equipment is less costly than steam power equipment.

Stand-by losses, such as those due to banked fires and radiation, are avoided.

Power is economized when using a number of motors, thereby eliminating losses incident to operating long lines of shafting.

Electric motors have a better all-day efficiency than steam engines.

The number of motors operated can be changed as occasion requires, so that power is used at the point of application only when needed.

Owing to the sub-division of the power equipment, the breakdown of any one unit affects only that part of the industry operated by that unit.

Where motors are used long lines of belting are avoided.

Fire risk is minimized.

Floor space is economized. Motors can be placed anywhere, thus reducing the investment in buildings.

Immunity from strikes affecting coal supply or of stationary engineers and firemen.

Large saving on account of the very small expenditure required by the modern electric motor for maintenance and repairs.

Motors can be started or stopped at will either at the point of application or at a distance remote therefrom.

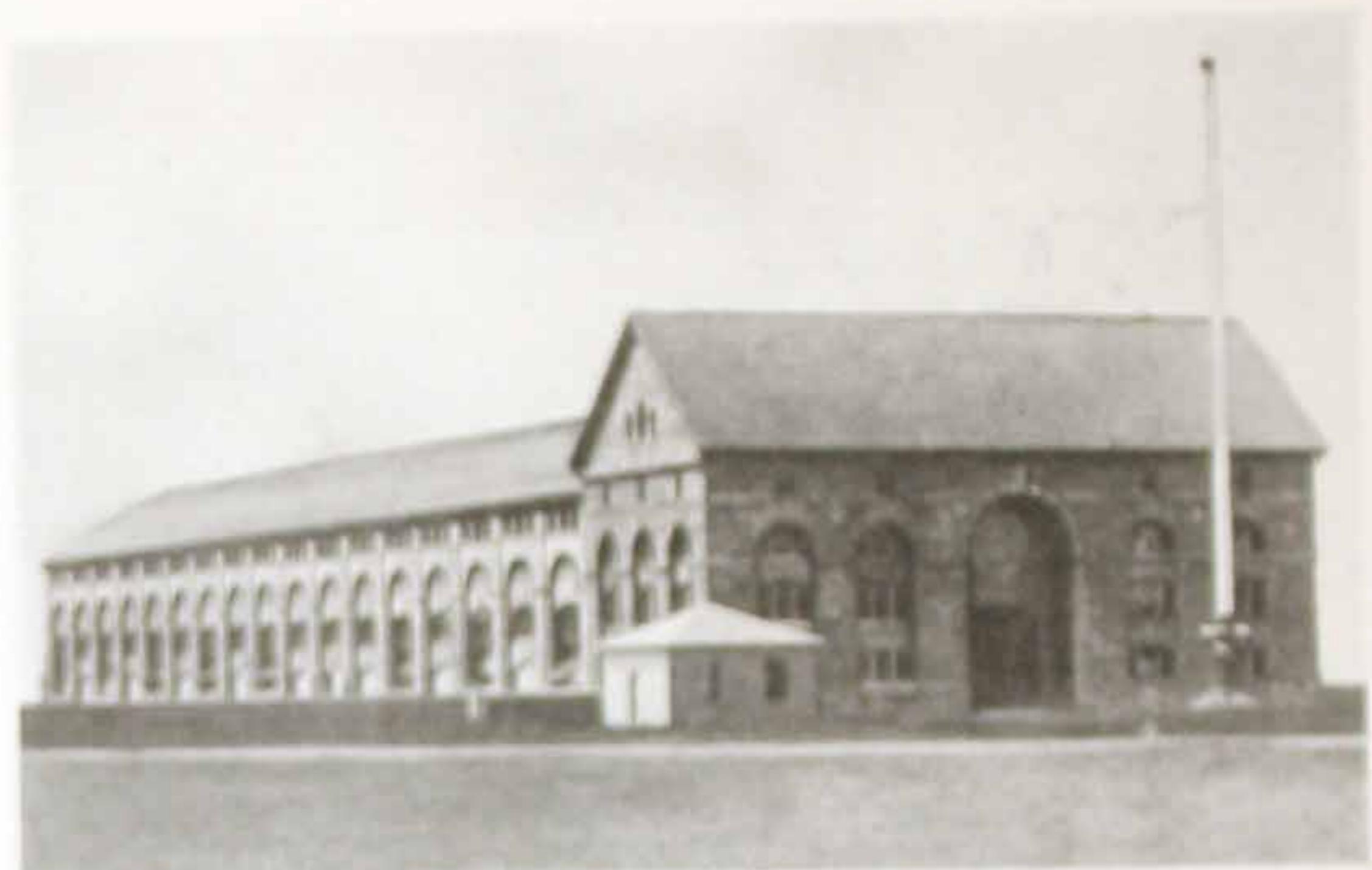
Safety in operation is insured by the inherent and automatic regulation of the motors.

The efficiency, simplicity and integrity of electrical equipment do away with the necessity for skilled labor.

Additional power can be obtained from the Niagara System whenever required by simply adding a motor.



FOR years, summer and winter alike, Niagara Falls has been the Mecca of thousands of travelers. A natural waterfall known the world over and accepted as one of its greatest wonders, situated in a region replete with historical romance and yet in the heart of the western continent's industrial zone, it brings to its brink each day a throng to admire its grandeur. Dignitaries from empires and kingdoms, notables from our own Continent, have come and gone, and a second time have come and studied its ever-changing aspect. The world's greatest men and women have tried to picture it in phrase or color, but ever with the same inadequacy of effort. Amongst the vast throng that watched the changing colors in the rising spray there were those whose minds turned to the turbulent waters and saw hidden in that great volume a power which, properly developed and applied, would set in motion countless wheels of indus-



First Great Hydro-Electric Generating Station—Power House No. 1

try and cause the ring of factory bells to be heard around the world.

Many plans were devised for the harnessing of Niagara, but it was not until 1888 that a feasible one dawned upon the horizon of the world's work. Then it was that the United States granted a series of patents covering the generating and distributing of what were termed polyphase electrical currents. The invention embodied in those patents made possible the transmitting of electrical energy over great distances. With such a possibility reasonably assured, The Niagara Falls Power Company began on October 4, 1890, the construction of its first great hydro-electric generating station.

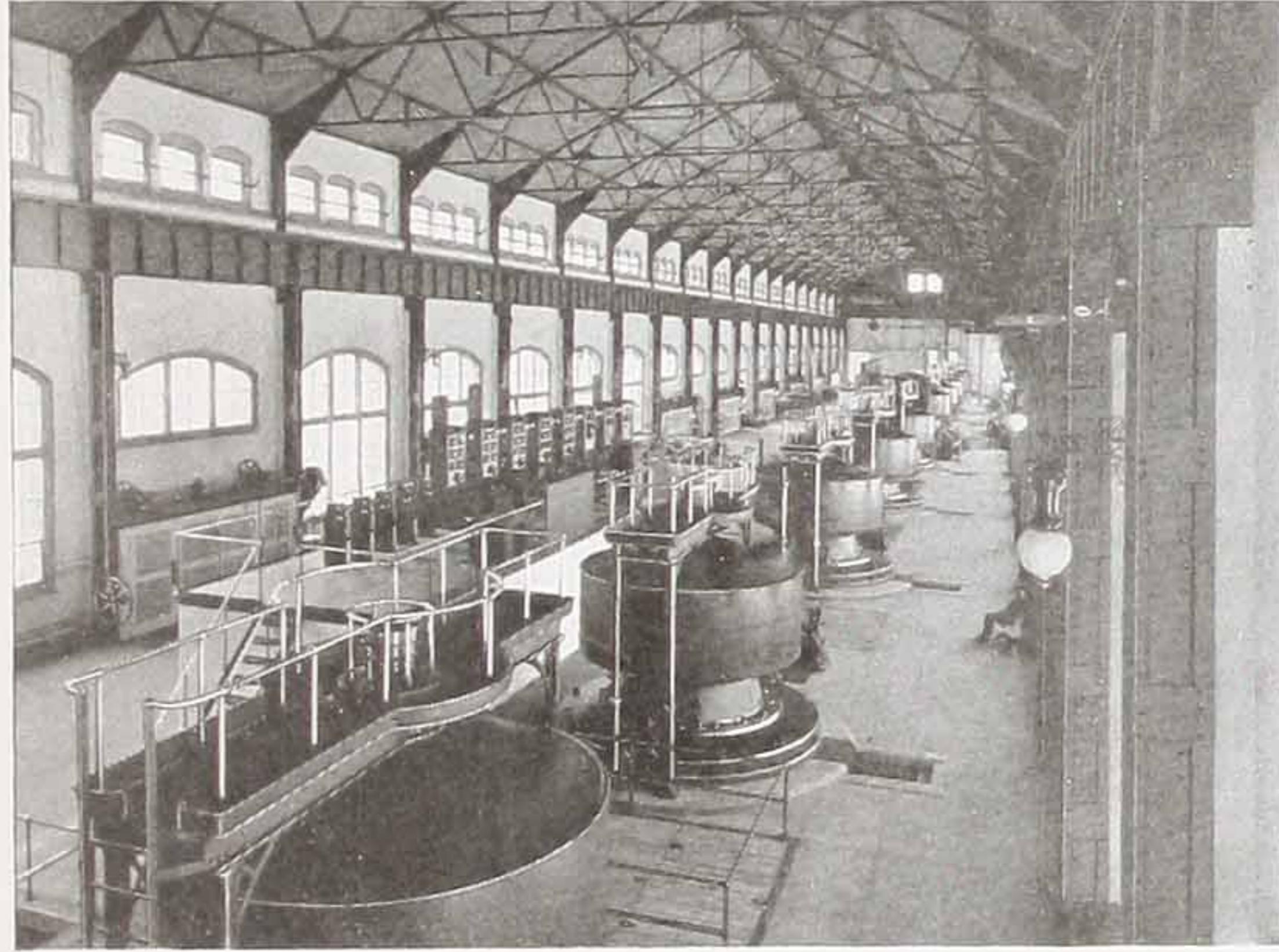


5,000 H.P. Generator and Governor

Not quite five years later electrical power for commercial purposes was delivered from that

station, and, on November 15, 1896, the same power was first used commercially in Buffalo, twenty-five miles away.

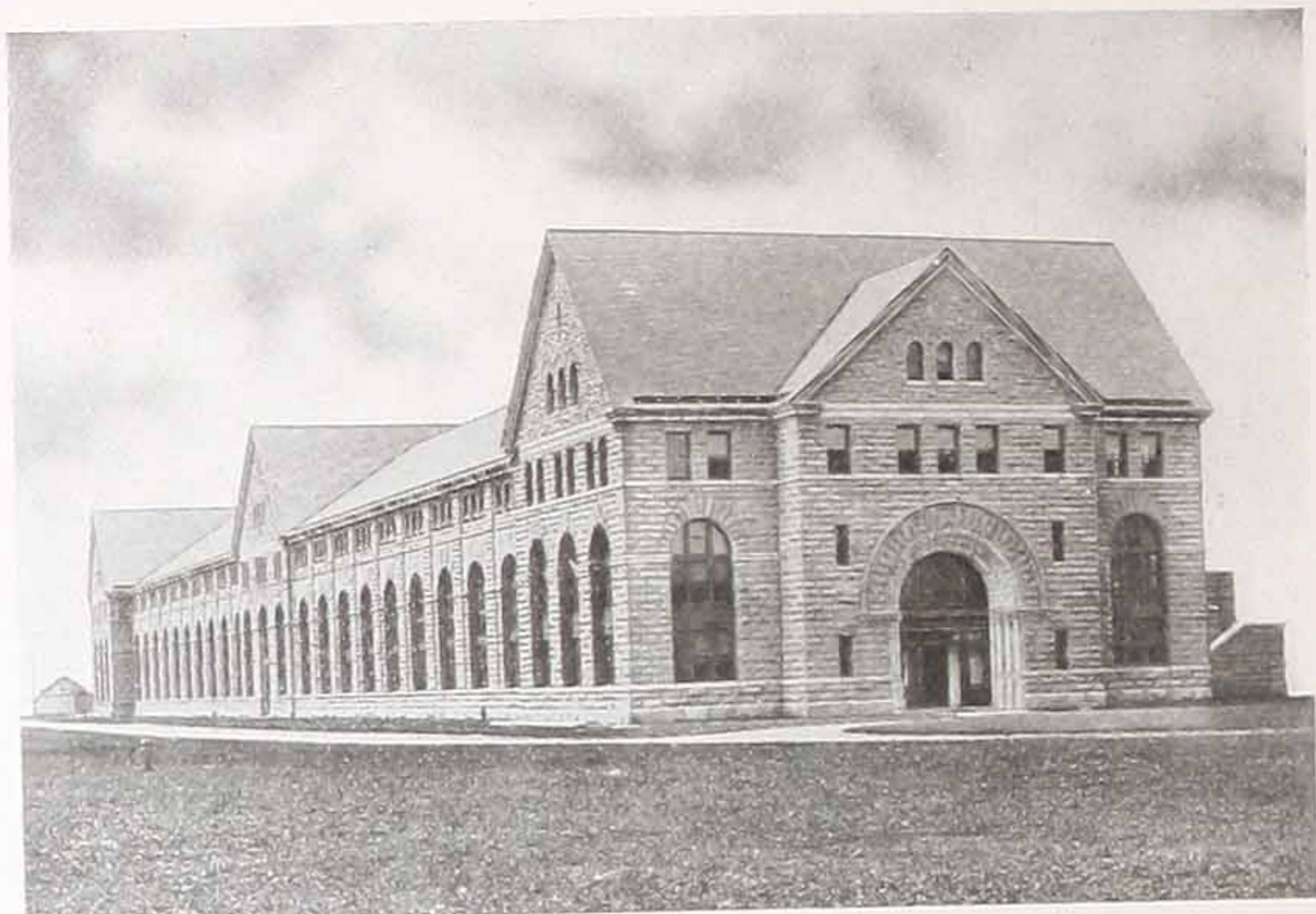
Beginning with the modest number of three generators and the small output capacity of 15,000 electrical horse-power, the first generating station grew to a capacity of 50,000 electrical horse-power; then a second station close by was completed, with an additional capacity



Interior of Power House No. 1

of 55,000 electrical horse-power, whilst across the river in the Dominion of Canada, a third station was being built, which to-day has available 50,000 electrical horse-power out of an ultimate output of 110,000 horse-power.

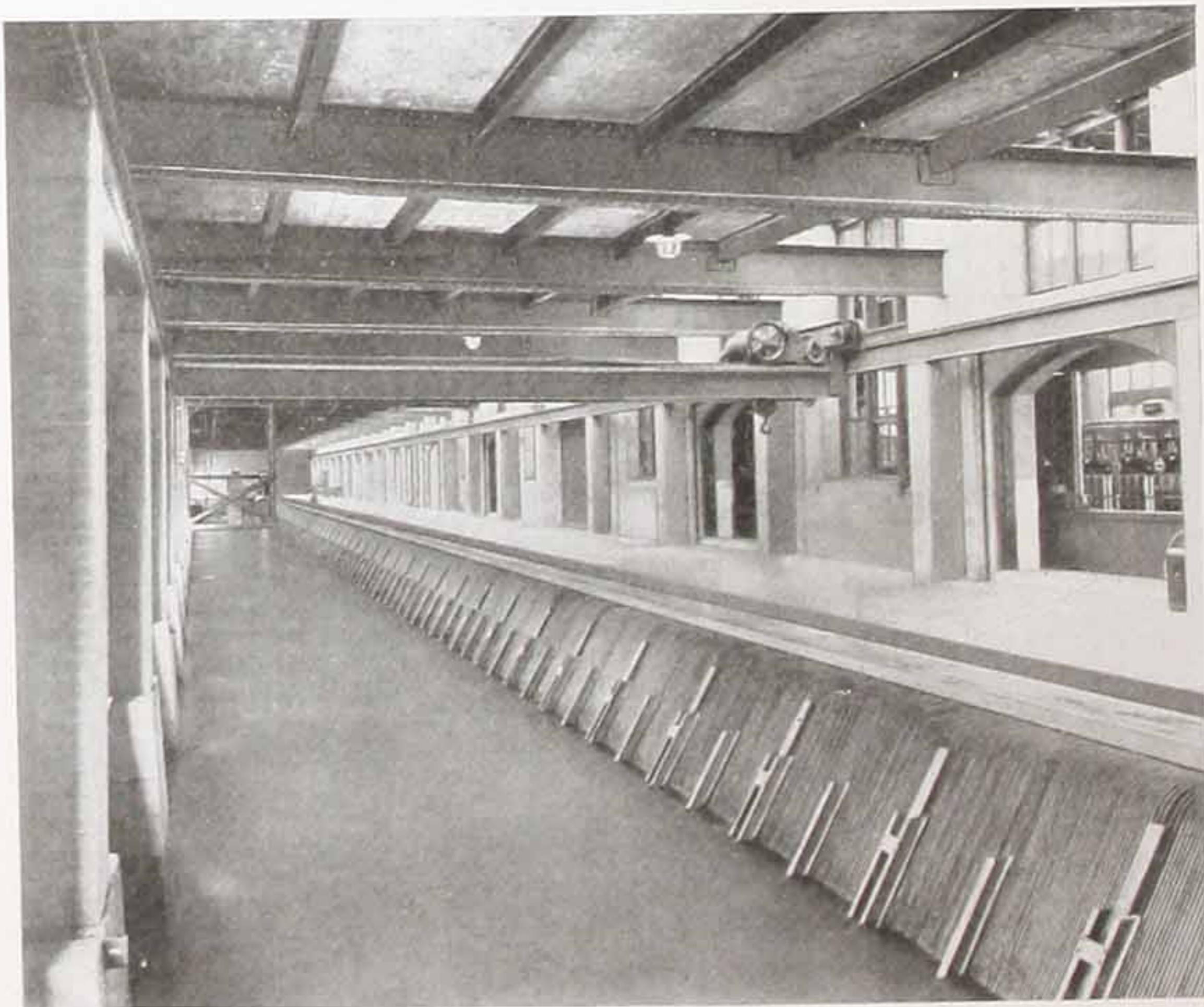
In the beginning the technical features of the enterprise excited the wonder of men; even to-day the great stations of The Niagara Falls Power Company and Canadian Niagara Power Company are the subject of study and praise by engineers and laymen alike, whilst they must



Power House No. 2

ever be the most interesting of the wonders associated with the world's greatest and grandest waterfall.

The American power-houses are situated upon opposite sides of the same canal and about one mile above the falls. They have been erected at one end of the Company's lands, which lands comprise some eleven hundred acres, with a

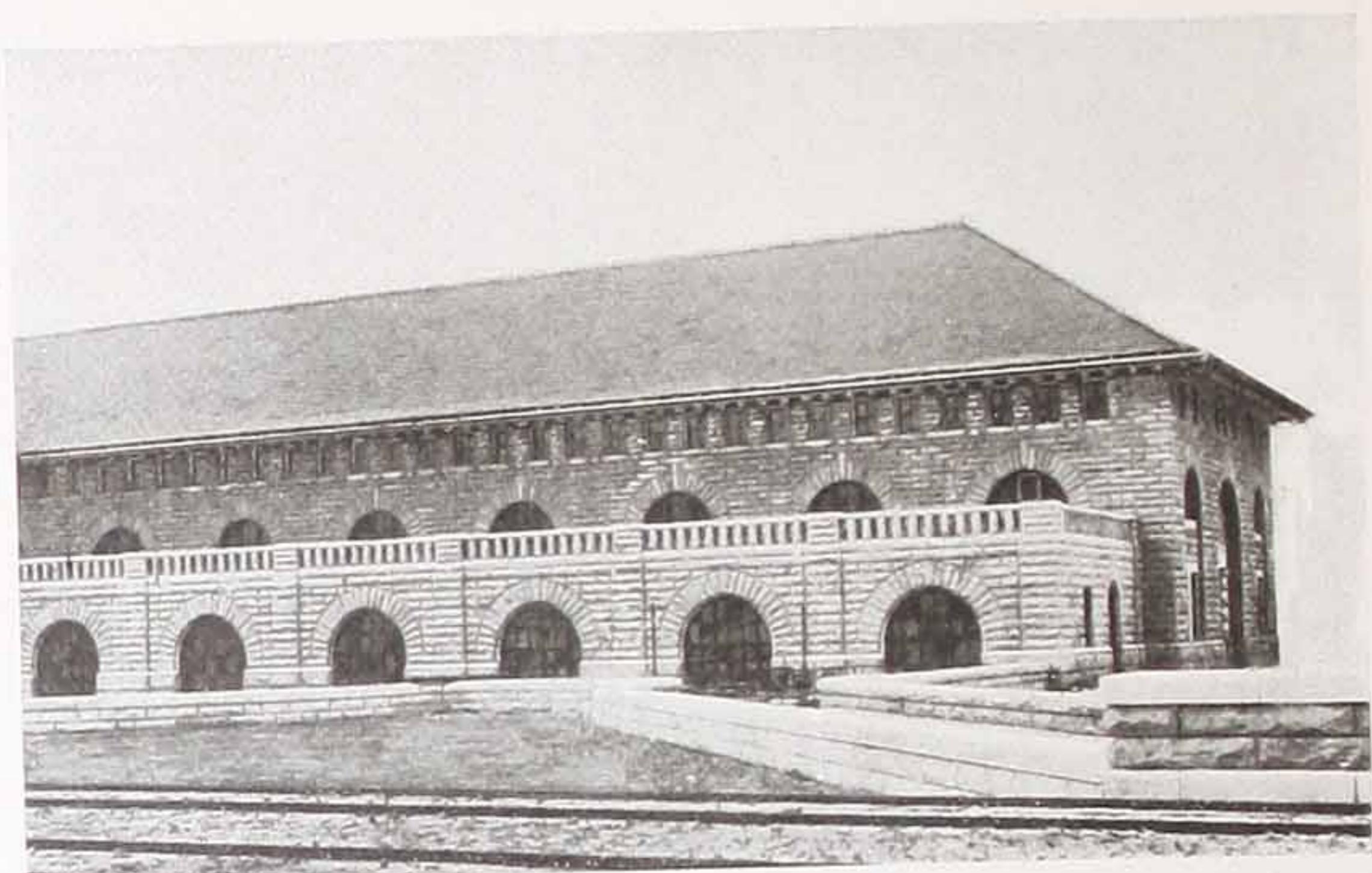


Covered Forebay—Power House No. 2



Interior of Power House No. 2

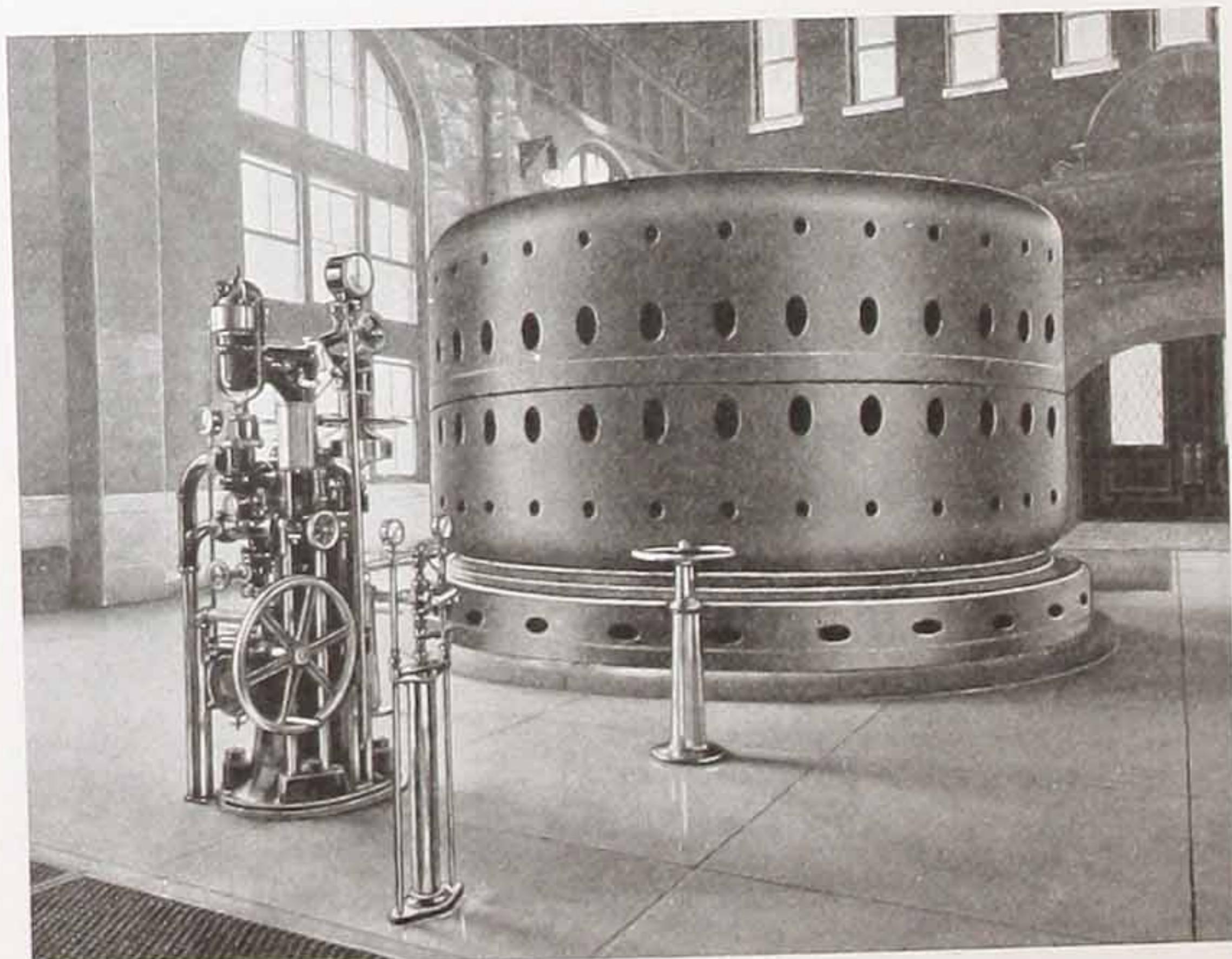
river frontage of about two miles. Such of this land as is not used by the Power Company for its buildings is available for the requirements of manufacturing concerns that use its power. A great many industries already have taken advantage of locations upon this desirable property, which fronts on the river, is sewered and is so level that no grading is required. The lands also have convenient and necessary trackage connecting with the trunk lines, through the medium of the Niagara Junction Railway, a terminal railway owned and operated by The Niagara Falls Power Company. The location of these industries and



Canadian Power House—North-east Corner

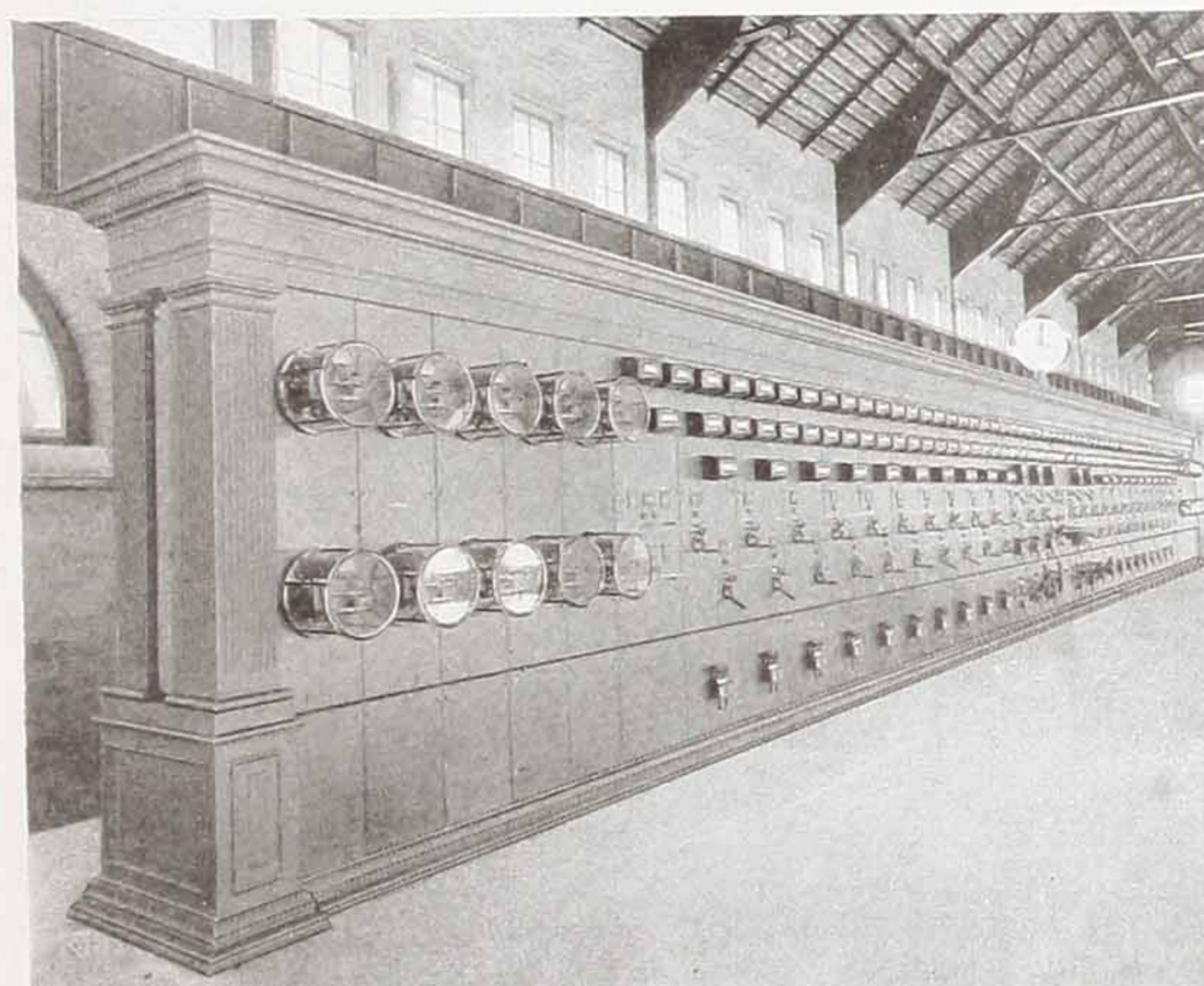
lands is such that no buildings for manufacturing purposes have been erected within a mile of the falls, and consequently the beauty of its surroundings has in no way been impaired.

A portion of the Power Company's lands is occupied by an attractive village called Echota, built for the benefit of employees and officials of tenant companies. It is so situated as to be easily accessible to all the lands reserved for



10,000 H. P. Generator in Canadian Power House

manufacturing purposes. Echota is built upon the most approved modern lines, with lawns, streets and lights maintained without expense to tenants. Rentals are at figures easily within reach of those for whom the homes are intended. The Company will also sell houses and lands upon favorable terms to those who wish to own their own homes.



Canadian Switch Board

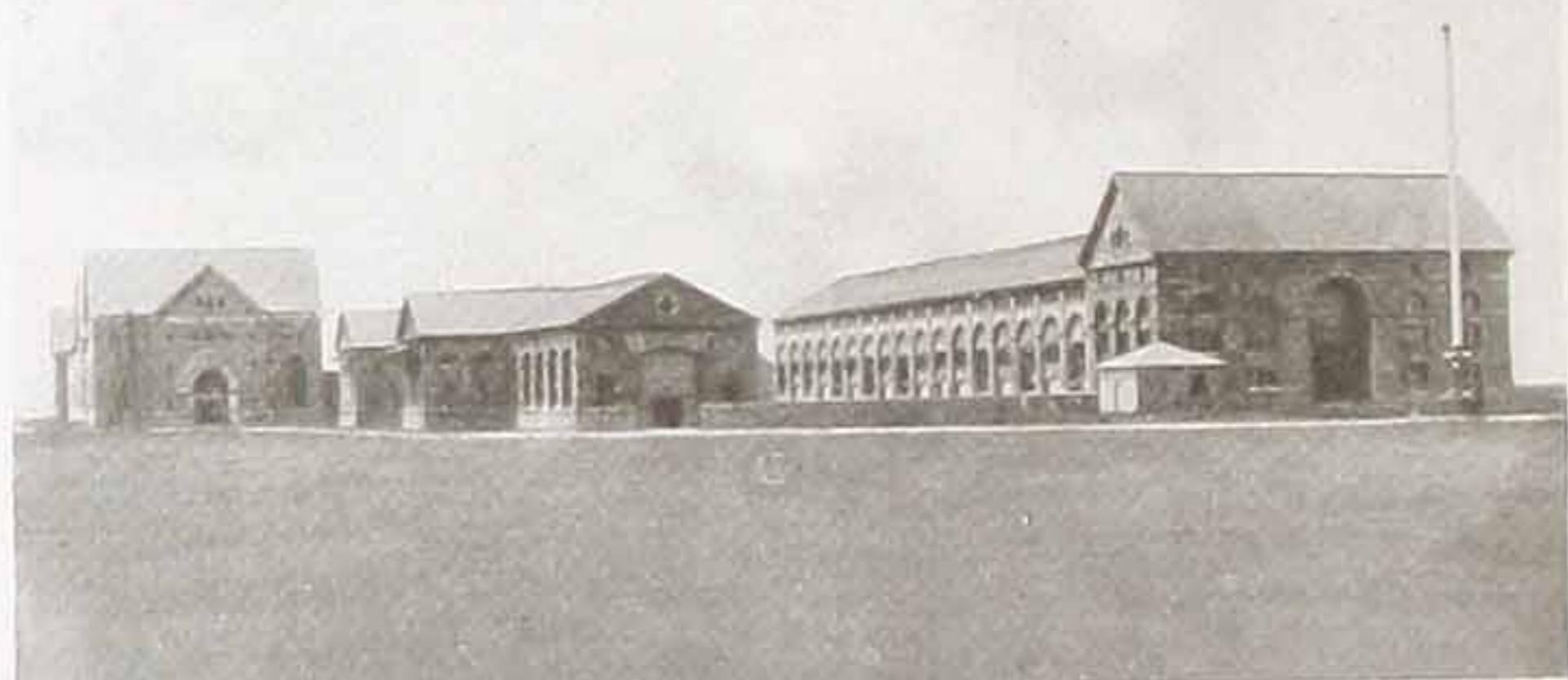
The two stations upon the American side of the river have in operation twenty-one generators, each capable of delivering continuously 5,000 electrical horse-power. In the Canadian station there are five generators, each with an output capacity of 10,000 electrical horse-power. Each generator of the three stations is driven by an independent water-turbine, and each turbine obtains its supply of water through an independent steel penstock connecting with the inlet canal. Physically, therefore, each generating unit is quite independent of any other part of the equip-

ment. By means of a comprehensive system of automatic and reliable switching devices, the generators of all stations can be thrown into any desired combination with respect to one another. This arrangement is further facilitated by a system of underground cable circuits between the American and Canadian stations. In this way, each power-house can act as a reserve for the other two. This installation of a number of

generators of large capacity in separate buildings, so con-



Canadian
Power
House



Two American Power Houses and Step-up Transformer House

nected as to be operated individually or in groups, with an abundant provision of transmission circuits, gives to the system a stability and flexibility which are of paramount importance and which are impossible of attainment in any other manner. Add to this the unfailing uniformity of the river level and the constant speed of machinery, and it is readily seen that the power service offered by The Niagara Falls Power Company and Canadian Niagara Power Company cannot be equaled anywhere in the world. In every way the interests of the con-

sumer are safeguarded, and interruptions to the power-supply calling for more than passing notice are next to impossible.

To summarize: the purchase of power from either of these two companies at Niagara Falls secures

*THE BEST POSSIBLE POWER
AT THE MOST REASONABLE PRICE
WITH THE BEST GUARANTEE OF CONTINUITY
FROM THE GREATEST ELECTRICAL
DEVELOPMENT IN THE WORLD*

The customer need pay only for power actually consumed.

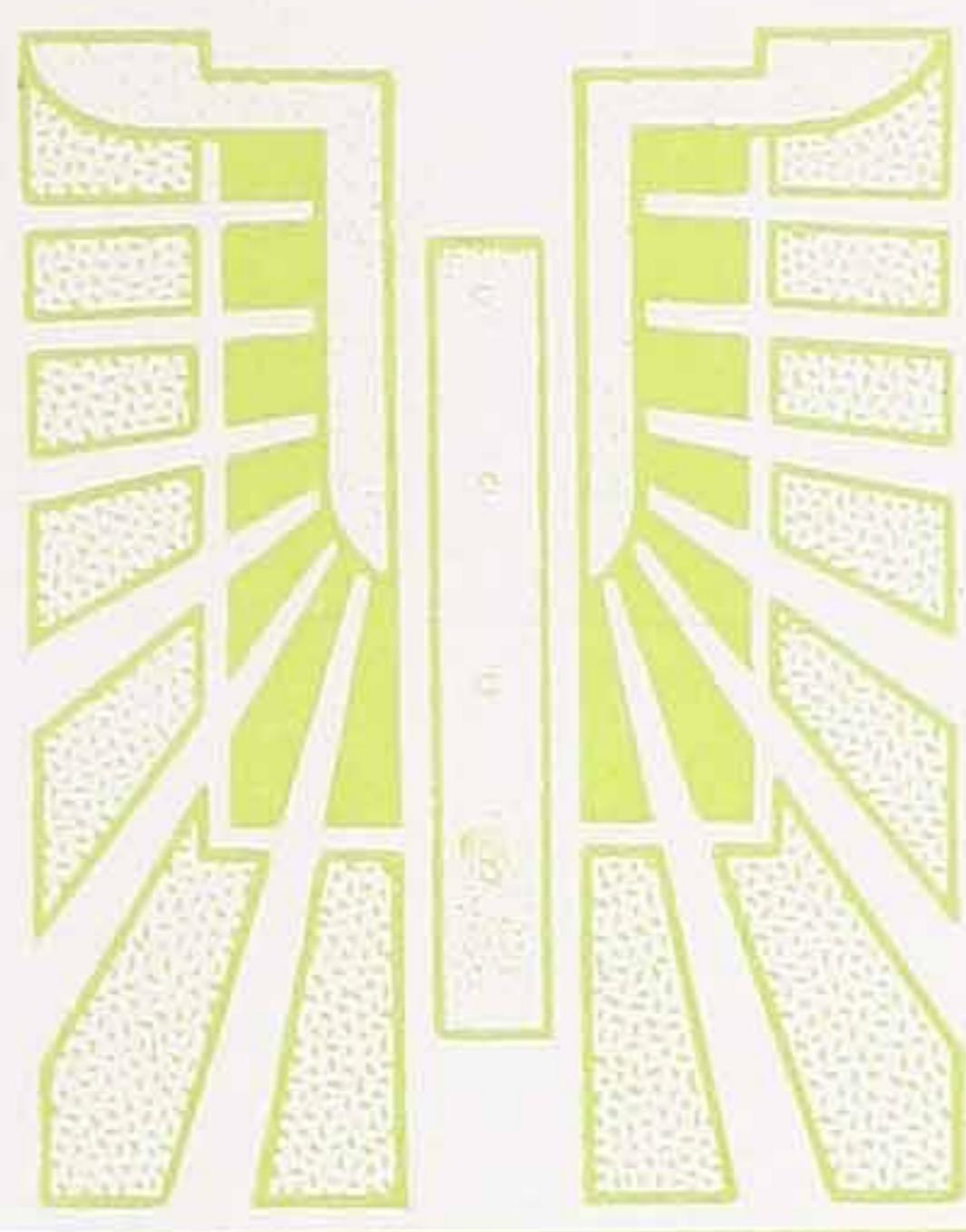
Niagara power can be applied to any and to all classes of service.

There is a uniformity of speed not obtainable with any other form of motive power.

The continuity of service is unequalled by that of any other form of power plant in existence.

The power is ever ready. To adapt a well-known popular phrase:— You press the button and Niagara power does the rest.





The Niagara Falls Power Company

Officers :

President, D. O. Mills
V.-Pres., Edward A. Wickes
Sec., Frederick L. Lovelace
Treas. and Assistant Sec.,
W. Paxton Little
Gen. Mgr., Philip P. Barton
General Agent,
Elwood Grissinger

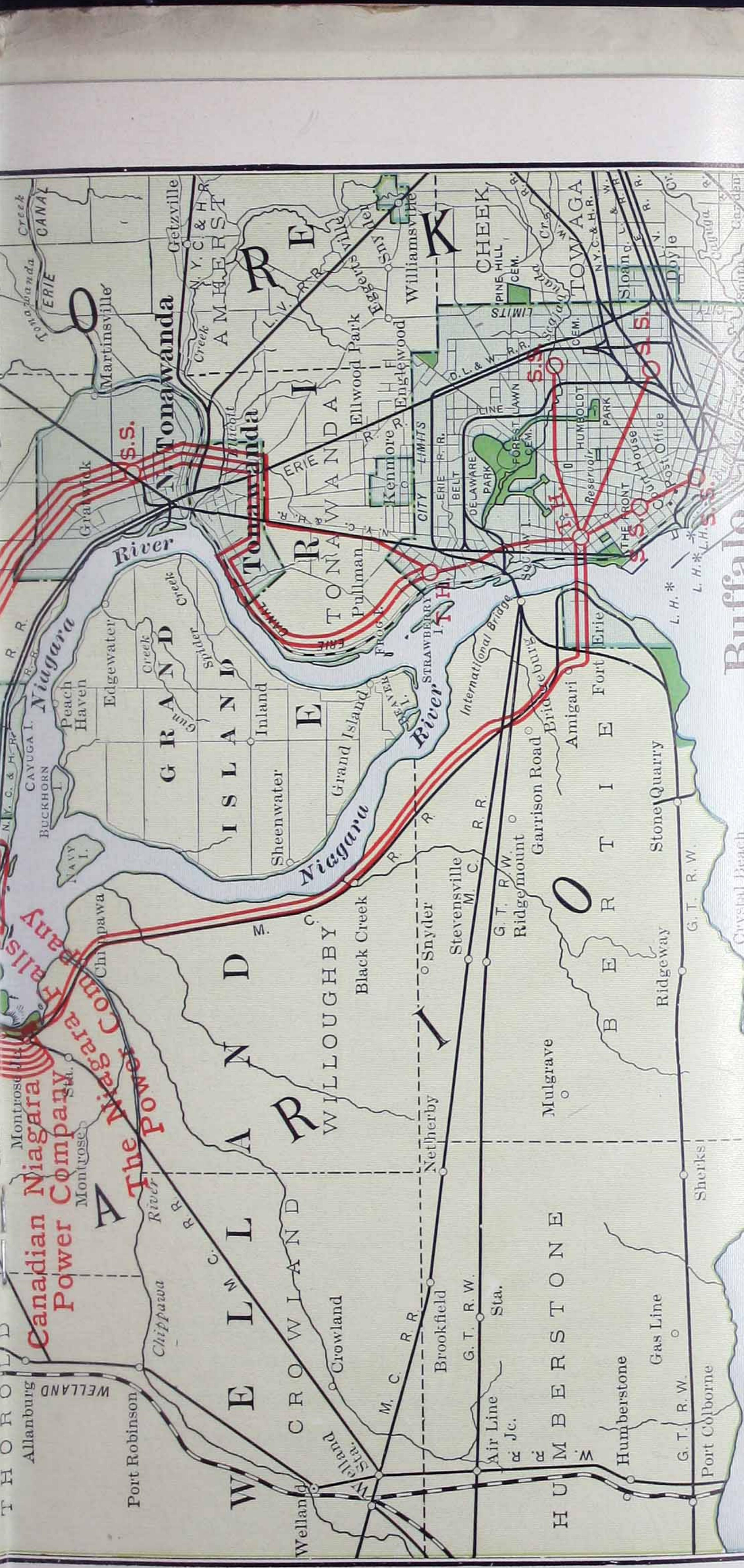
Board of Directors :

Edward D. Adams
John Jacob Astor
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Charles Lanier
Joseph Larocque
D. O. Mills
Victor Morawetz
Daniel O'Day
deLancey Rankine
Francis Lynde Stetson
E. T. Stotesbury
Frederick W. Whitridge
Edward A. Wickes



The Niagara
Niagara
Canadian N
Niagara





settings, pumps, steam piping, flues and stack, facilities for coal storage, engines, foundations and belting—demanding altogether a large amount of floor space. The cost of a large installation of such equipment will be approximately \$50 per rated horse-power. An electric motor using Niagara power to perform the same service can be installed for considerably less than one-half of \$50 per rated horse-power.

The simple forms of steam power plants obviously have the highest operating costs. To obtain lower operating expenses from steam power plants necessitates the installing of more expensive boilers, compound or triple expansion condensing engines, feed water heaters, condensers, stokers and other auxiliaries. This adds very largely to the investment, and therefore proportionately increases the fixed charges. The operating efficiency of an electrically-driven plant utilizing Niagara power can be improved by installing a number of motors, thereby subdividing the motive power and reducing the dead load due to shafting losses. The power cost for machines not in use can be stopped instantly by shutting down the motors by which they are driven. The subdivision of the installation into a number of motor units requires a relatively small additional expenditure and involves no increase in floor space.

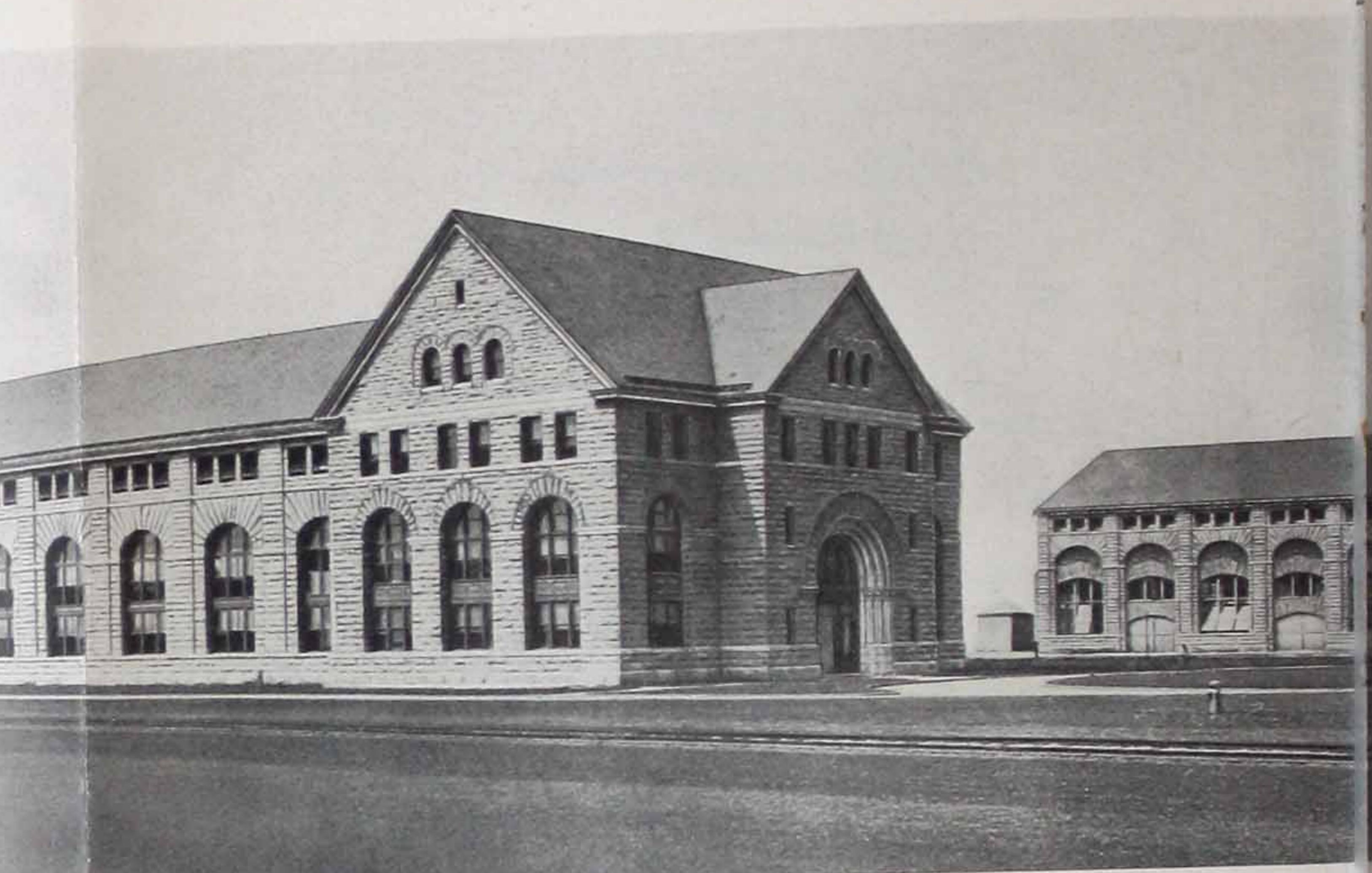
A steam plant requires a force of men to operate and maintain it. A modern motor, properly installed, and used on the Niagara system, does not call for the attention of men especially fitted or trained for the work. The

ordinary factory force can give such motors all of the attention they need.

It has been demonstrated that the electric drive is the most economical for shop practice. Consequently, most modern factories install such systems, either purchasing or manufacturing the electrical power, and distributing it throughout the buildings for use in electric motors. The manufacture of electric power increases the power plant investment by the amount of the cost of the generators and switchboard equipment. There is a loss of power in the engine and generator which amounts to at least 25%; that is to say, 25% more power must be developed by the engine than is delivered to the motors to perform useful work. The use of Niagara power delivered at the motor enables the manufacturer to save that 25%.

The extent to which central stations deliver power to manufacturing establishments is substantial evidence that it is less expensive to purchase power than to manufacture it in private plants. A special report of the Department of Commerce and Labor, Bureau of the Census for 1902, shows that in the United States motors having an aggregate capacity of 434,681 horse-power derive their energy from central power stations. This report indicates that be-

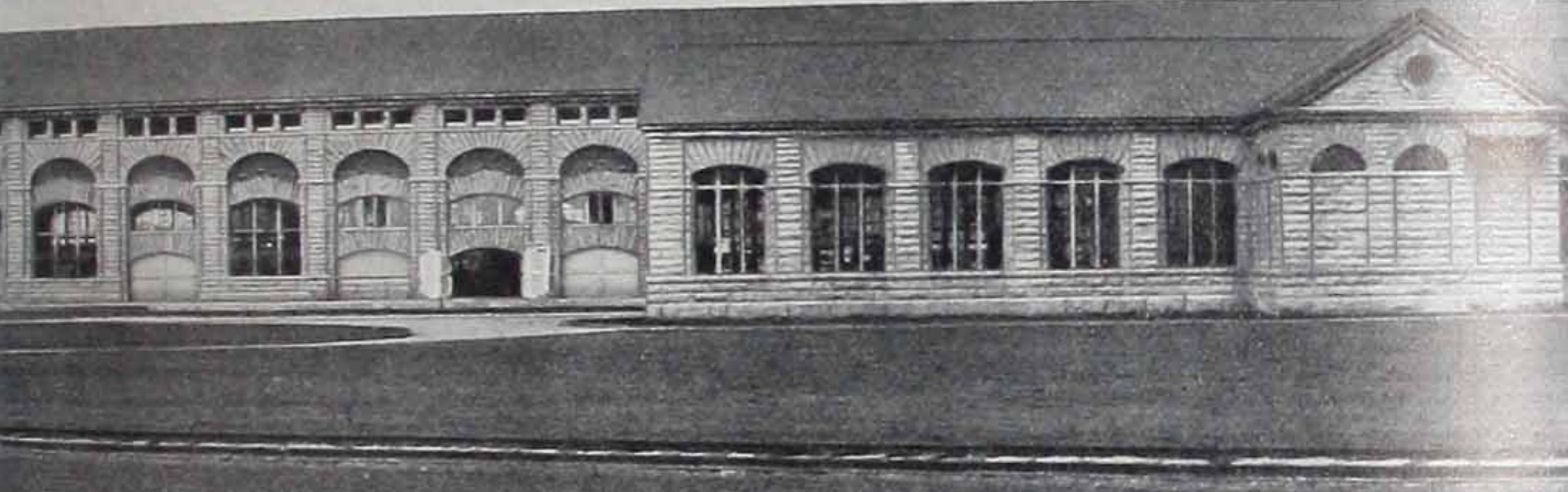
"In the great enterprise at Niagara, we see not only a bold right direction, as indicated both by exact science and philanthropy. With resources so unequalled, with commercial facilities and an enthusiasm and progressive spirit of its citizens, it is sure to become"



principal trunk lines of the Eastern States and their traffic arrangements with numerous other lines.

(3) Shipping facilities by water are available by way of the Niagara River, and also by the Welland Canal, which connects Lake Erie and Lake Ontario, and which furnishes an excellent route, not only for shipping to Canada and to the United States, but also to Europe by the St. Lawrence River. Navigation is also available via the Great Lakes to the West and via the Erie Canal eastward to New York.

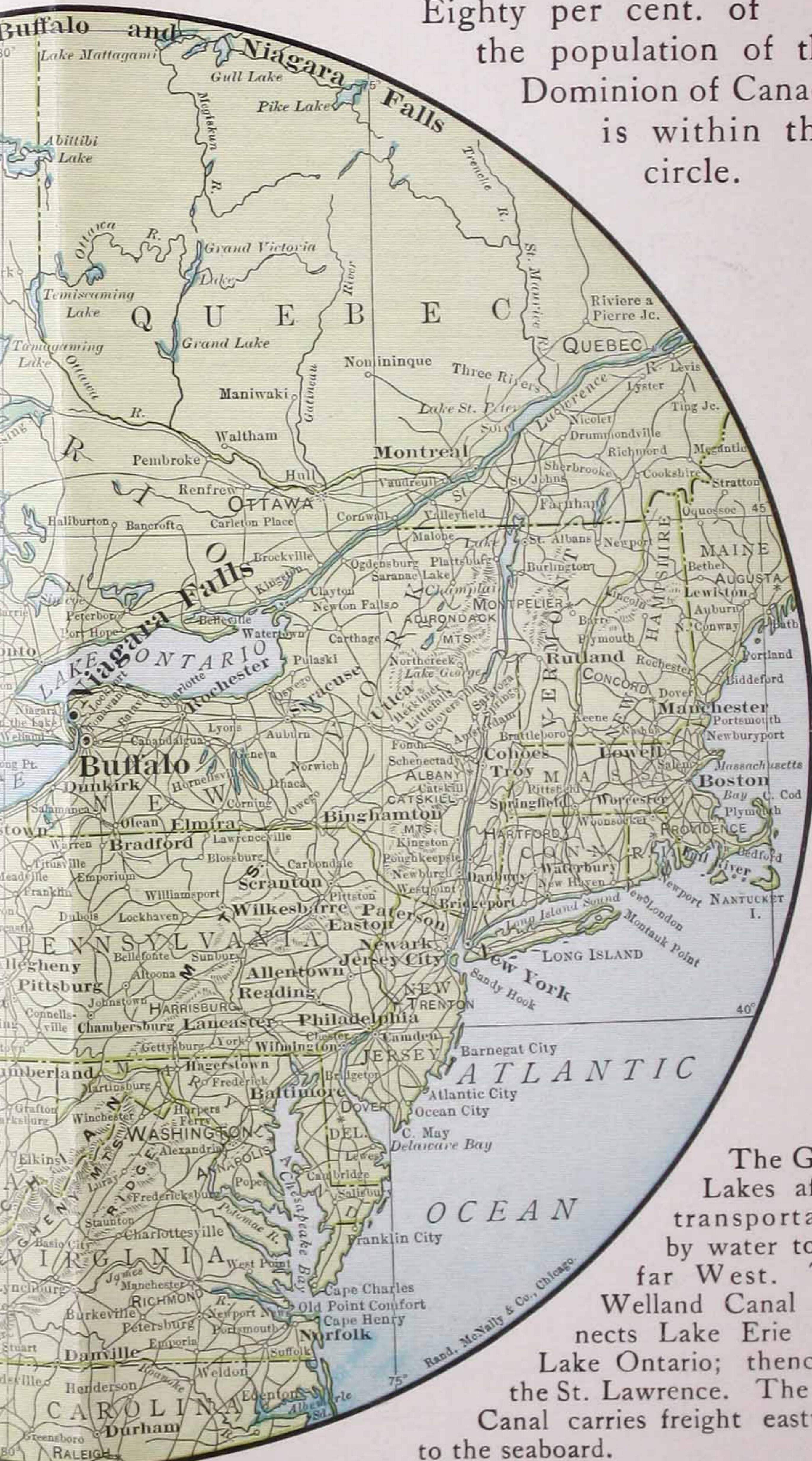
(4) The labor market is all that could be desired. The Niagara frontier has been singularly free from troubles caused by strikes. There is an abundance of labor both skilled and unskilled. Among the many industries which have located here in the past few years employing thousands of hands not one has met



with any difficulty in securing an ample supply of labor of the quality required.

(5) Locations for factories. The Niagara frontier presents exceptional opportunities to acquire high grade factory sites. In general, no cheaper sites possessing anything like equal advantages can be found anywhere on this Continent. Moreover, The Niagara Falls Power Company and Canadian Niagara Power Company own extensive tracts of land on both sides of the river, where excellent sites for factories can be had. These lands will be leased to tenants using the power, upon favorable terms which are virtually equivalent to ownership. Houses for workmen can be obtained at a convenient distance, where comfortable homes can be established. This circumstance helps to lessen any risk of strikes, for the workman is surrounded with comforts

Eighty per cent. of
the population of the
Dominion of Canada
is within this
circle.



The Great Lakes afford transportation by water to the far West. The Welland Canal connects Lake Erie with Lake Ontario; thence to the St. Lawrence. The Erie Canal carries freight eastward to the seaboard.

Freight Carrying Systems—*Continued*

Wabash Railroad.

Pere Marquette Railroad.

The Niagara, St. Catherines & Toronto Railway.

Toronto, Hamilton & Buffalo Railway.

Delaware, Lackawanna & Western Railroad.

Pennsylvania Railroad.

Buffalo, Rochester & Pittsburg Railroad.

Buffalo & Susquehanna Railroad.

Pittsburg & Lake Erie Railroad.

Terminal Lines:

Niagara Junction Railway.

Buffalo Creek Railroad.

Water Routes

Via Port Dalhousie, the Welland Canal and Great Lakes.

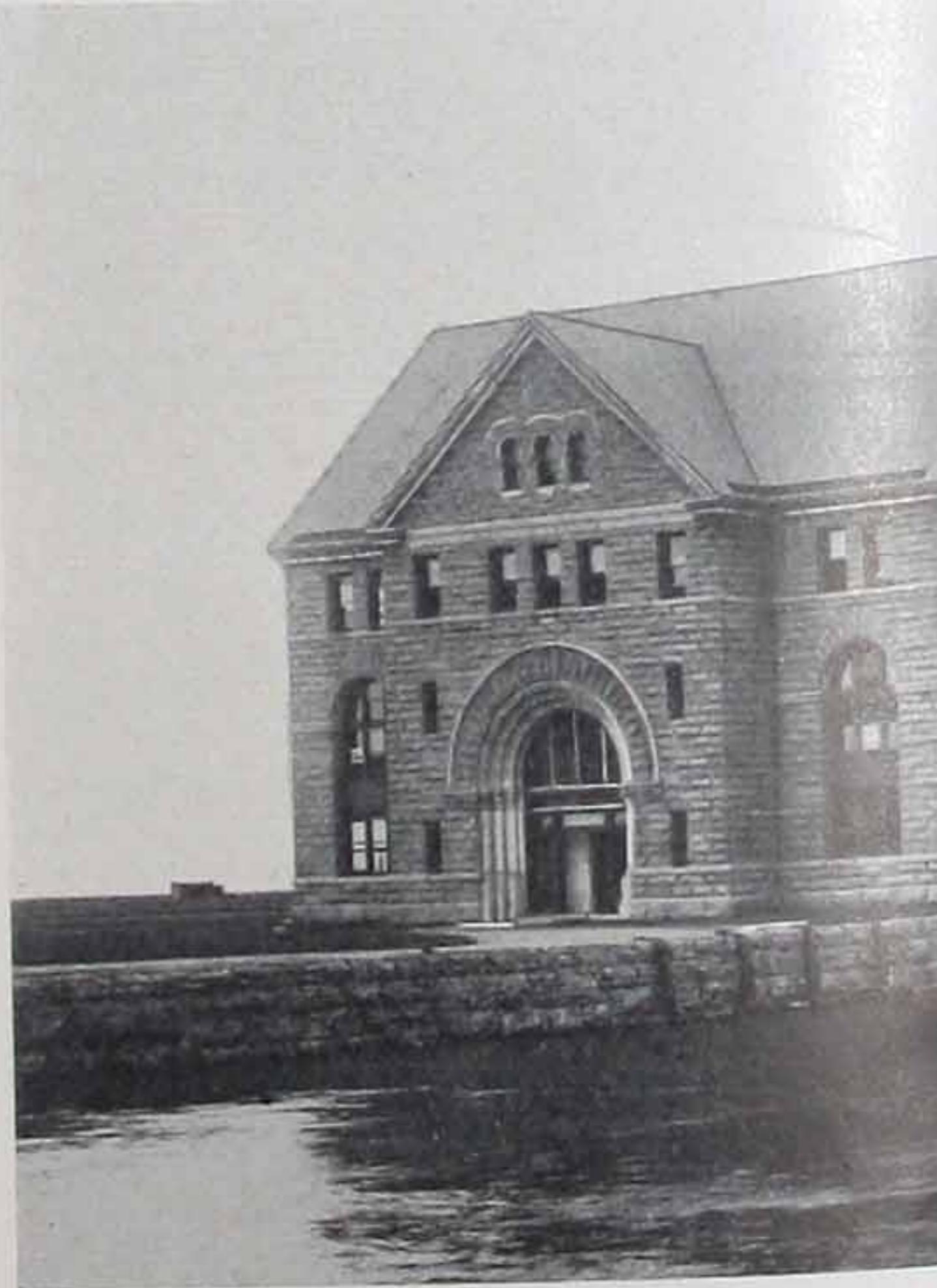
Via the Niagara River and the Erie Canal.

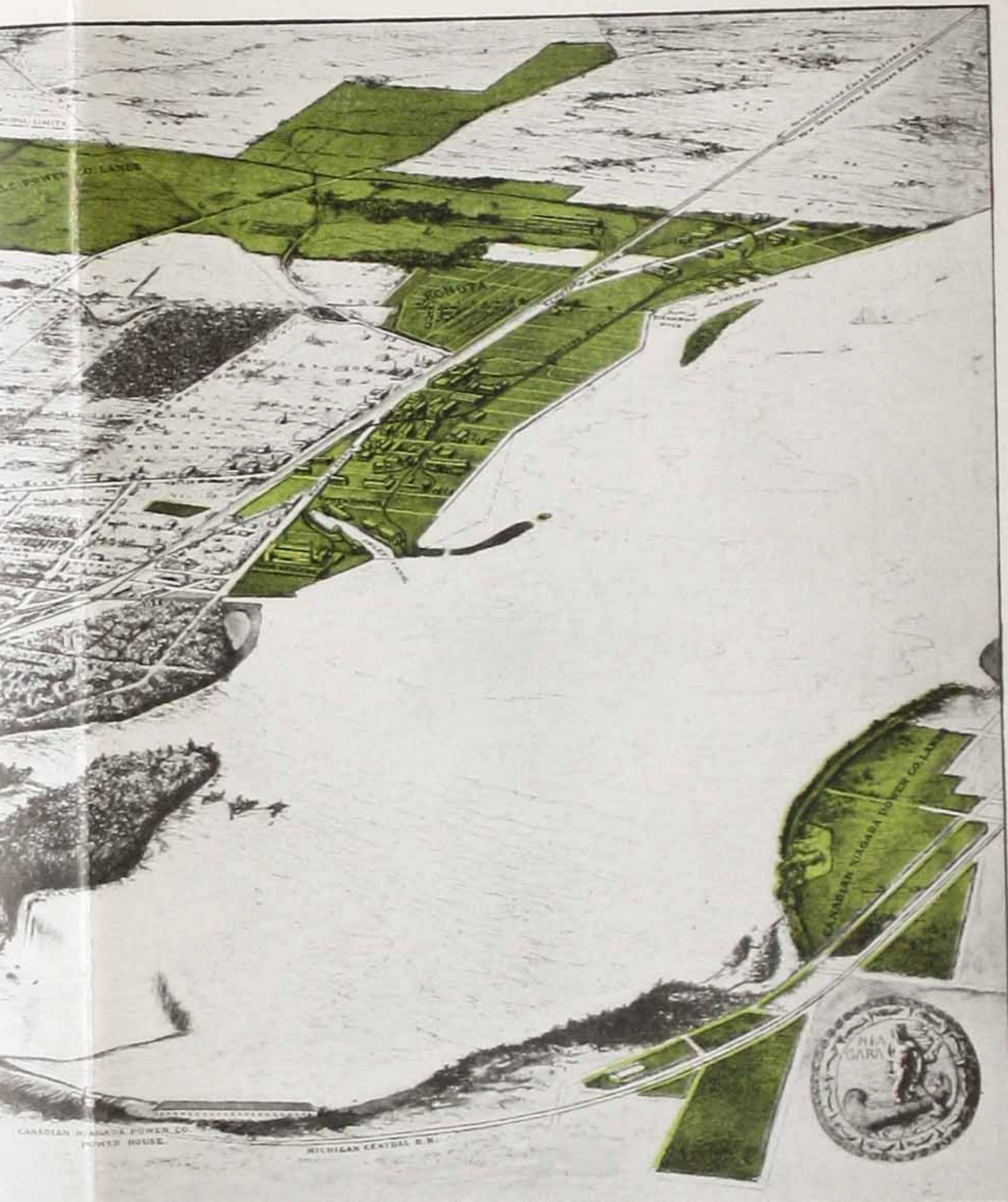
Via the Niagara River and the Great Lakes.

Via Lewiston to Toronto and the St. Lawrence River to Europe.

View showing Canal and Power House No 2.

Water enters the enclosed forebay through submerged openings in the masonry wall, that prevents ice and drift material from entering and clogging the turbines.



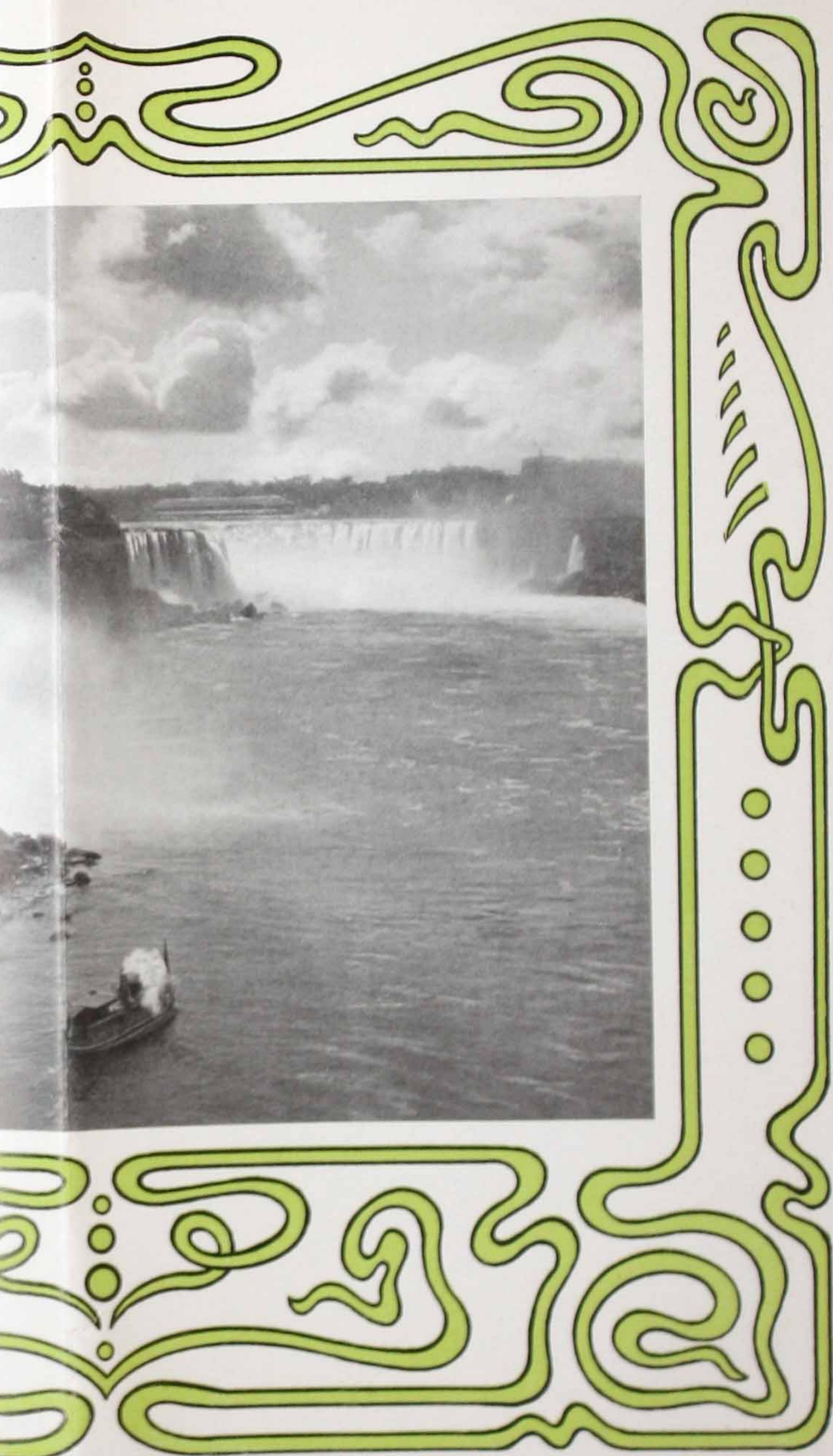
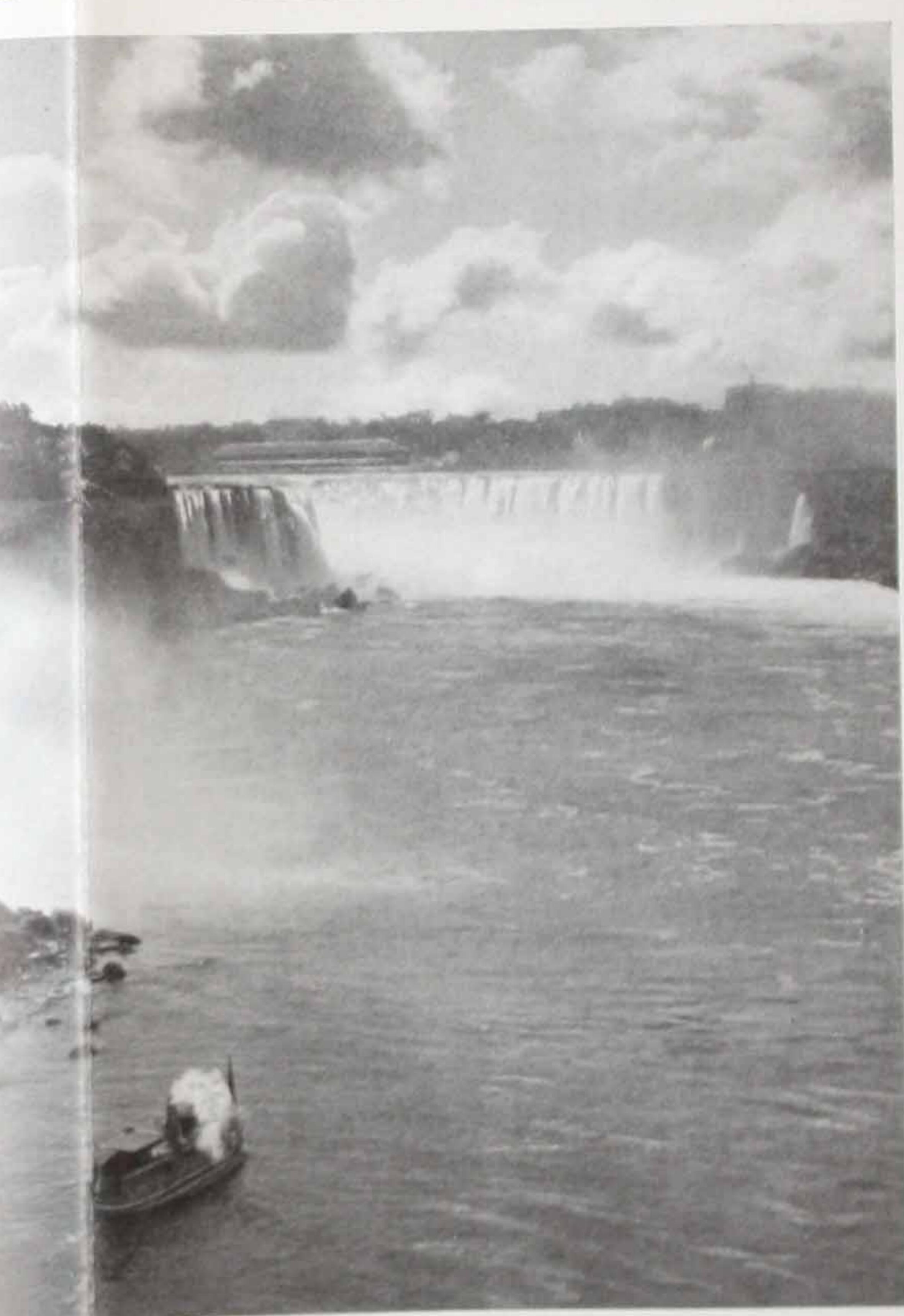


An extraordinary amount of advertising accrues to the benefit of every industry in Niagara Falls, without any payment therefor, by reason of the world-wide publicity given to everything pertaining to the locality. This advantage has already been experienced by industries which have located at Niagara Falls.

The map upon the center page shows the relative location of the municipalities on the Niagara frontier, many of the transportation lines, the river, the Lakes and the routes of the existing transmission lines between Niagara Falls and the cities shown. It will be observed that there are three separate and distinct electrical transmission pole lines, two upon the American side of the river and one upon the Canadian side. Ultimately there will be two pole lines upon the Canadian side of the river, and all told there will be eight complete and separate transmission circuits emanating

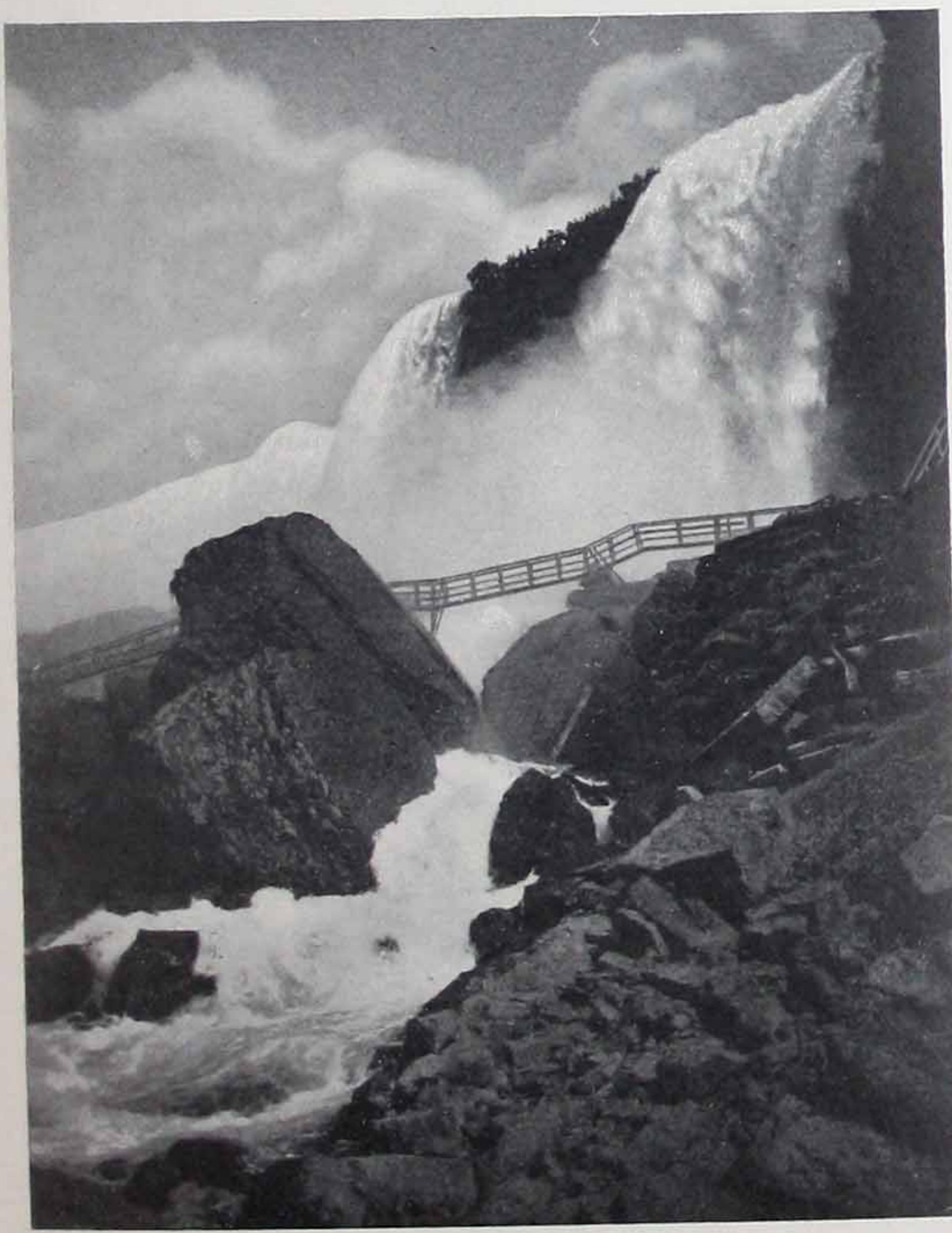
Local All Rail Freight Between the Niagara Front

STATION	CLASSES					
	1ST	2ND	3RD	4TH	5TH	6TH
Portland, Me.						
Boston, Mass.						
Burlington, Vt.	44	38	30½	21½	18½	15
Providence, R. I.						
Hartford, Conn.						
New York, N. Y.						
Trenton, N. J.						
Philadelphia, Pa.	39	33	28	19	16	13
Baltimore, Md.						
Pittsburg, Pa.	35	30	22	14½	11½	10
Cleveland, O.	27½	24	20	13	10	8½
Cincinnati, O.						
Richmond, Ind.	42	36	27	18½	15½	13
Louisville, Ky.						
Terre Haute, Ind.	45	39	30	21	18	15
Toledo, Ohio.						
Detroit, Mich.	36	31	23	16	13	10
Indianapolis, Ind.						
Saginaw, Mich.	44	37½	28½	19½	17	14
Chicago, Ill.						
Milwaukee, Wis.	45	39	30	21	18	15

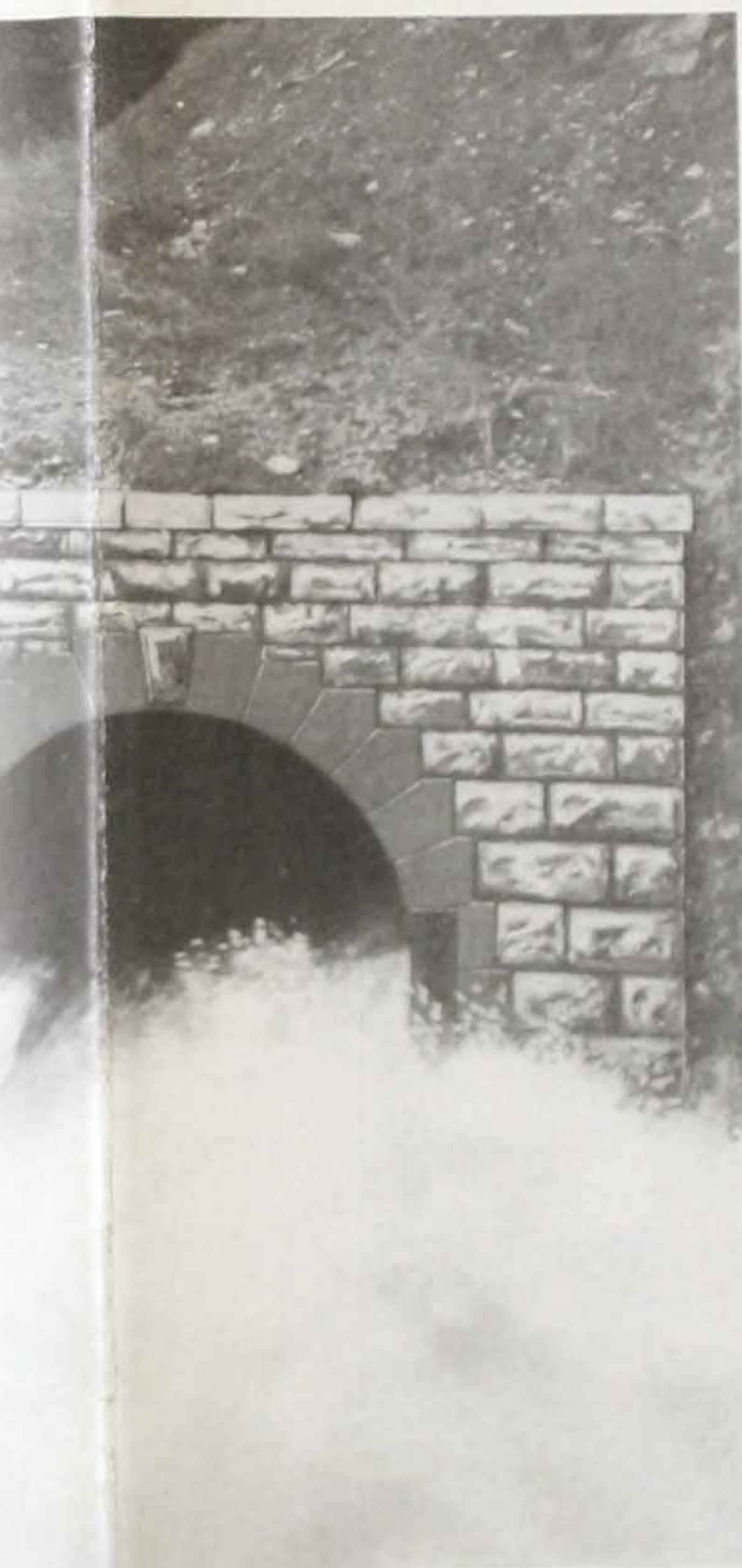


Business in the United States, Canada and Abroad

Great prosperity exists in Canada, and greater prosperity is predicted on account of the extensive public and semi-public works now under construction. Any concern which does business or contemplates doing business in Canada and in the United States, or in the United States and in foreign countries, should locate on the Niagara frontier where the American and Canadian plants can be administered by one set of executive officers, virtually at the expense of a single office and administrative force.



Rock of Ages



Niagara Falls Power Company
Niagara Falls, N. Y., U. S. A.

Niagara Power Company
Niagara Falls, Ontario, Canada.



*Canadian Niagara
Power Company*

Officers :

President, Wm. H. Beatty
V.-Pres. and Sec.,
A. Monro Grier
Treasurer, W. Paxton Little
Gen. Mgr., Philip P. Barton
General Agent,
Elwood Grissinger

Board of Directors :

Wm. H. Beatty
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BUFFALO

THE TONAWANDAS

NIAGARA FALLS

"CITIES OF THE GREAT FRONTIER"



**50,000,000 of America's people
are within a radius of 500 miles
A ride of a night**

Favored with navigation upon the Great Lakes of America and the 1,000-ton barge canal, otherwise known as the Erie, as well as transportation over twenty or more railroad lines, the Niagara frontier is at once the best distributing center on the **AMERICAN CONTINENT**